

2.3.3 Stream Crossing Structures Flood Damage

The economic impact to stream crossing structures along the study reach was evaluated based on three floodplain management alternatives. The evaluation was based on the results of the existing hydraulic simulations (HEC-RAS) completed by the U.S. Army Corps of Engineers, as-built drawings, and available GIS data. The evaluation included six street crossing structures located along Dead Man's Run at 33rd Street, Huntington, UNL East Campus Loop, 48th Street, Francis Street, and 56th Street. Figure 2-1 shows the location of these stream crossing structures and Appendix A contains photographs of all six stream crossing structures.

A review of the hydraulic profiles through each of the stream crossing structures was completed to determine which structures could, or could not, pass the 100-year event without overtopping. Table 2-5 displays the results of this review.

As Table 2-5 shows, three of the structures have adequate capacity for all three alternatives with no overtopping of the decking, while the remaining three structures did not have adequate capacity for any of the alternatives without overtopping. This unfortunately provided little variation between the three floodplain management alternatives because a structure either passed all, or passed none, of the floodplain management alternatives. Therefore, because this evaluation was to estimate the economic impact to a typical reach within Lincoln, it was decided to artificially raise the decking profile of the 48th Street so the existing 100-year WSE could pass through the structure without overtopping the decking under the no net rise alternative.

The economic evaluation was calculated by assuming that undersized structures (i.e. structures with overtopping more than 6-inches) would be replaced to meet the various floodplain management alternatives. The replacement cost was based on typical construction costs for new bridge construction and street approaches leading up to and away from the new bridge decking elevation. Because the floodplain was very wide in some locations it was not economically practical to assume that the entire bridge decking and adjoining streets within the floodplain would all be elevated completely out of the floodplain. Therefore, the construction cost estimate was based on replacing the bridge over the main stream channel and assuming street approaches with a length based on a 40 to 1 slope. Table 2-6 summarizes the results of As noted previously, the costs presented in Table 2-6 are replacement costs, which is different than the annual flood damage cost presented in the previous two sections on public building and public access street flooding.